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EXPLORATION



RESEARCH



PREPARATION



The
AMERICAN MUSEUM
OF NATURAL HISTORY

PUBLICATION



EXHIBITION



EDUCATION



ASTRONOMY G E O L O G Y

ANTHROPOLOGY A R C H A E O L O G Y

A FEW REPRESENTATIVE



B I O L O G Y B O T A N Y

MUSEUM EXPEDITIONS



LIBRARY OF THE

FOR THE
PEOPLE
FOR
EDVCATION
FOR
SCIENCE

HISTORY AMERICAN MUSEVM OF NATVRAL



*A Modern Citadel of Science
A Glimpse of the American Museum of Natural History from Central Park*

THE AMERICAN MUSEUM OF NATURAL HISTORY

An Interpretation



Published by the Museum

MCMXXXI

NEW YORK

THIS brochure, a Museum product, has been made possible by the joint labors of American Museum officials, scientists, artists, photographers and printers.



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BED ROCK

AN INSTITUTION which rests squarely upon basic schist one billion years old may with truth claim to be a bed-rock establishment. On such a physical base, as in the case of the Biblical wise man, the American Museum of Natural History has built its house of granite, buttressing this great structure of the 'Seventies by successive additions until the floor space will soon aggregate twenty-two acres.

On a rock-like base, too, has been erected its scientific work; now, in America's chief city, the Museum stands as one of the world's great repositories of human knowledge concerning our planet—its origin, structure and place in our universe; flora and fauna, past and present; races of men.

Into every life zone of the globe, into every recess of history and pre-history the Museum has projected its searching till half a hundred exhibition halls are not enough to hold its collections, nor two hundred-odd study rooms and laboratories to care for its research

material. Yet the work which the world has come to expect of it is barely begun.

Like a shifting kaleidoscope that vast work constantly makes new patterns. The astronomical department is found observing island universes thousands of light years away; a staff geologist records earth tremors felt in the Philippines, while indefatigable fossil hunters, home from Patagonia, or Africa, or Alaska,

ferry across the Hudson to ex-hume from under the Palisades the skeleton of some phytosaur buried for a hundred and fifty million years. . . .

Great exploring parties leave for the Gobi desert, for Greenland, for the Antarctic Circle—while a one-man expedition crosses the street to count the species of southward bound migrants that pause

overnight in Central Park . . . Not far away in a New Jersey backyard the curator of entomology is collecting insects after hours for Museum cases—eight hundred and thirty-six species caught in one backyard. . . .



BED ROCK

This continent has, as is known, an edge, a shelf, a jumping-off place into very deep water indeed—twelve to thirty-five thousand feet. On the slopes of that black abyss inhabited by finny, phosphorescent grotesques, a Museum ichthyologist, not sixty miles from his laboratory, trawls for specimens. . . . In the Bahamas a curator, from a submarine tube, directs the removal by divers of forty tons of submerged coral reef to make a replica for an under-sea exhibit. . . .

Within Museum walls, research parallels or transcends the work of discovery in the field. Experiment, for example with some of the unknown resources of endocrinology, upon salamanders as subjects, has already shed much light upon the chemical messengers of the body

which control the reproductive cycles of higher animals, including man. . . .

Everywhere about this great institution—in field and research laboratory, exhibition hall and preparation workrooms—are the visible evidences of that restless, inquiring spirit of man which forever must be investigating the heavens above and the earth beneath and the waters under the earth, and still find new miracles to surpass the old. . . . Here is kept as nearly complete a three-dimensional diary of our own evolution as may be found anywhere.

It is of importance to all of us that there be no lapses in this fundamental record—that the hands of those keeping it be upheld and enough other hands be procured to make every needed entry.



ORACLES

THE FIRST museum was Greek; the name means Temple of the Muses. As greatly revered as those temples of knowledge, some founded by Aristotle under the patronage of Alexander, were those other Grecian shrines, the Oracles, the most famous—the Cave of Delphi—being the traditional mouthpiece of the Earth Goddess herself before it was claimed for Apollo.

The modern museum is both temple and oracle, or mouthpiece of earthly wisdom.

As Temple:

The American Museum was visited last year by a million votaries; over two hundred thousand attended its public lectures and motion pictures; fifteen hundred its cultural courses for teachers. More than six hundred schools of Greater New York sent classes and teachers here for study and received nature collections, slides, films; the educational contacts made with a million school children reached



the amazing total of twelve and a half million! In addition, nineteen universities, colleges and art schools used the Museum as an extension field for the work of undergraduate and graduate students.

This institution is headquarters and meeting place for twenty-four scientific societies, six of them national; it is either headquarters or a center for the conventions, exhibitions and field study of twenty-seven other associations representing American education, arts and industries. Such varied and specialized groups as photographers, jewelers, engineers, lumbermen, horticulturists, fishermen, conservationists, and classes of the blind and deaf frequent this Museum en masse.

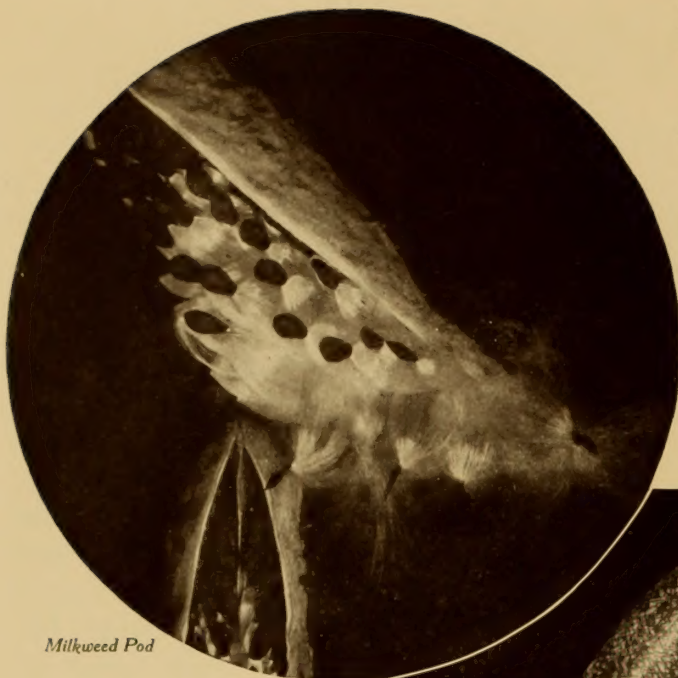
As Oracle:

Departments and officials have put to them every day in the year questions the number and range of which would have caused the Pythian priestesses of Apollo to resign in a body.

Museum Curators are Interested in Everything in Nature



ORACLES



Milkweed Pod

*The Commonest Things
in Nature Concern the
Museum—the Rarest—
the Oldest*



For example:

An eminent palaeontologist would like a detailed report on the depths of the submerged land connections between five Mediterranean islands and the mainland.

The Rockefeller Foundation wants all extant data on fish as exterminators of mosquito larvae to use as a handbook for doctors and field men in tropical countries.

Representatives of the Tanners' Council and of the United States Treasury Department respectively call upon the curator of mammals to ascertain the exact meaning of the words "bovine species" in a proposed tariff bill, since upon their definition would

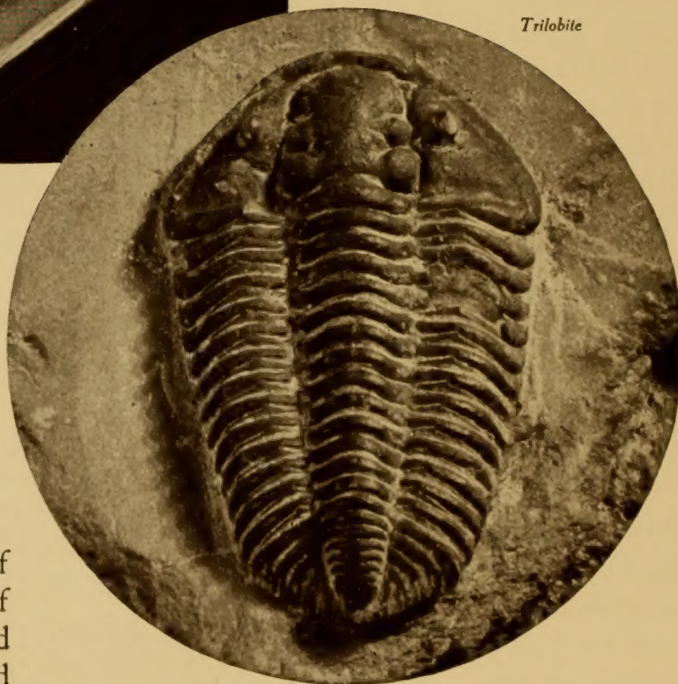
hang the levy of heavy duties on hides about which a contest might arise.

A cancer specialist requests a dozen specimens of lead ores of differing geologic ages and degrees of radioactivity. The specimens are secured for him from mines in Burma, India, Alaska, Canada, and the United States. Edison, at his request, breaks down the selected sample in colloidal solution, which now forms the basis for cancer treatment in a Long Island hospital. . . . To consult

the Museum's current index continuing Bashford Dean's unique bibliography of fishes, a professor of pathology journeys from the midwest, where tapeworm is on the increase in three states due to the habitual



"Gloria Maris" Shell



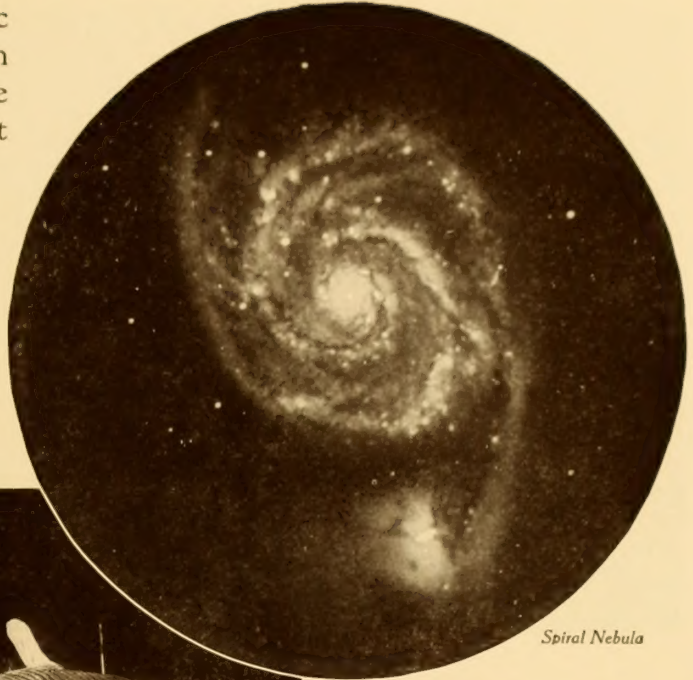
Trilobite

ORACLES

consumption of infected raw fish by the Baltic immigrant population. . . . A chemist in search of new sources of insulin inquires where sharks are being killed in such quantity that their insulin-producing organs may be readily obtained. . . . In the department of comparative anatomy—affiliated with Columbia University proper and with its College of Physicians and Surgeons—neurologists, dentists, and orthopaedists pursue researches into the evolution of body structures from lower animals to man, and one university orthopaedist, after a long and detailed examination of the feet of primates, is enabled to make a successful device to correct improper balance in the human foot. . . .

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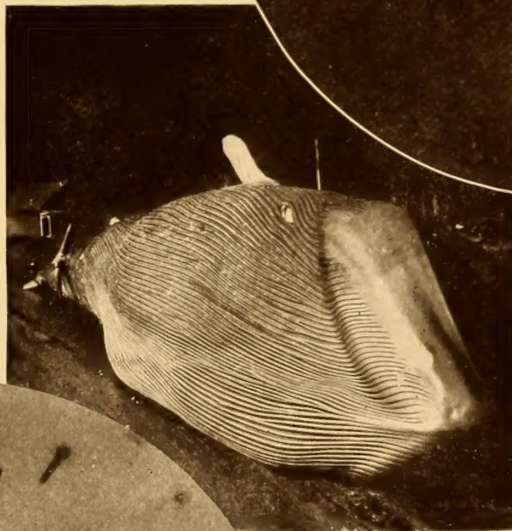
Tetanus Bacilli



Spiral Nebula

The Most Distant Natural Objects Also Concern the Museum—the Largest—the Smallest

~*~



Sulphur-Bottom Whale

By way of comic relief from sober scientific inquiry an anxious manufacturer, who has learned that Museum geologists can tell from an examination

of glacial deposits what the weather was thirty-five thousand years ago, wants to be told how many rubber overshoes to produce next year and the next!

The demands are never-ending. . . . Makers of automobile bodies and lacquers, silks, linoleums, and neckties seek colors and patterns for new "lines" from Museum minerals and birds; a leather company takes an impression of dinosaur skin as a novel design for embossing; one craftsman wishes to know the most resonant wood for violins,

ORACLES



*No Place is Too Inaccessible for the Museum Curator —
Visiting Remote Bird Islands*

another the most silent for silent typewriters. Pathé devises a film to display the famous jewels of the Morgan collection, and the producers of "The Lost World" model from Museum reconstructions, on a scale of inches, live-appearing dinosaurs.

Industry and government frequently make major requisitions upon the Museum's fund of knowledge. Explorers and research authorities are called into consultation on questions of legislation, finance, trade and immigration, development of new territory, and conservation.

Banking houses contemplating loans apply for information as to the resources of foreign countries; customs and immigration officials appeal for testimony in moot cases. . . .

An American construction company, required by the King of Abyssinia to build four hundred miles of difficult road for the transportation of materials for a new dam across the Blue Nile,



Collecting Corals Undersea

ORACLES

Descending into Caves to Hunt for Blind Salamanders

~

confers at length with a curator who has hunted for fossils all through the region. From him are obtained the facts upon which to base an estimate of the road's cost and potential revenue from tolls. Another corporation entreats his advice before floating a bond issue for a similar African highway to tap an area of mineral wealth. . . .

As is generally known, oil and mining companies lean heavily upon geologists for data as to the age and formation of the rocks in which they propose to operate. While



the basis of the Museum's work is pure science, its conclusions are appropriated by industry and applied science.



At Home in the Desert

ORACLES



*Above:
The Museum
Curator Climbs
to an Eagle's Nest*

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*Below:
Digging for Lizard
Eggs in the Tropics*

~

In the great field of conservation of natural resources, worldwide recognition has been accorded American Museum men for their distinguished contributions to this cause. When King Albert of Belgium sets aside a half million mountainous acres in the Belgian Congo as a sanctuary for the maligned and fast-disappearing gorilla, the public does not need to be reminded that this is a culmination of the labors of Carl Akeley. . . . When the Roosevelt medal is awarded one year to Hughes, Lindbergh, and that friend and adviser of Roosevelt, the Museum's chief ornithologist, the newspapers comment that he has done more than any other American to waken the country to an appreciation of its bird life and to bring about protective legislation. . . . To do as much for the animal life of the world the American Mu-



ORACLES

Above:
Reconnoitering
from Tree Tops in
the South Seas

~

Below:
Uncovering Fossils
in the Gobi

~



seum, under the leadership of its President, has worked closely with a dozen societies and governmental agencies here and abroad whose avowed object is retardation of the "close of the age of mammals." . . .

Discovering dinosaur eggs in the Gobi desert is not the only claim to fame of that young Museum explorer, known to thousands, who is also an authority on whales and legal measures to save them from extermination. . . . Sponges rather than whales are the concern of the Governor of the Bahamas when he consults the curator of marine life as to how to prevent the threatened extinction of certain valuable grounds. In diagnosing the trouble as overzealousness on the part of commercial fisheries unaware of the period required for sponge regrowth, the curator lets fall the dictum: "Men must learn

ORACLES

not to be spongers on the rest of the animal kingdom." . . .

Oracles all, these scientists whose salaries are fifty per cent. lower than those of college professors of similar calibre—whose departments are undermanned and underfinanced—whose time for the research that makes them of value to science and to the world of affairs is cut to shreds not only by routine labors which should be delegated but by the necessity for serving as general information bureaus. . . . If there were more assistants, both detail men

to relieve an executive and teaching-curators to take charge of the exhibition halls and lectures—then he might have more freedom for study and investigation in his field of science.

.

But meantime, on the heaped-up pile of his daily duties, the questions fall, thick and fast, till every department in the Museum is buried by them:

"Acting on the advice of Professor Julian Huxley, I am instructed to invite you to write for the Biology and Zoology sections in the



Like the Pioneers, the Museum Curator Crosses Western Deserts by Wagon—in Search of Insects

ORACLES

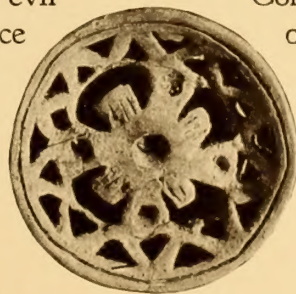


Aboard a "Whale Chaser" in the Antarctic

new edition of the Encyclopaedia Britannica the articles in the enclosed list"—(42 titles, with a space allotment of 116 columns totalling more than 80,000 words).

"Kindly tell, just in a word or two (!) what kind of rock forms the foundation for New York City, what fossils are found in it, are there any faults and what is its geologic age?"

"Will you participate in a round-table discussion on abatement of the smoke evil in our cities, with particular reference to the effect upon the health of the inhabitants through the loss of the beneficial ultra-violet rays?"



"Have you in your Library a picture of Palestine with definite kinds of cattle grazing?"

"As a retired professional man, I am thinking of taking up entomology as a pursuit. Will you be good enough to advise me how to begin?"

"Please suggest thirty-five Indian names with appropriate meanings for orders of merit for boys and girls winning woodcraft and Nature study badges."

"Our State [California] Game and Fish Commission is preparing a bibliography on the tuna fish. . . . May we send a representative for six weeks' work under your bibliographer of fishes?"
Et cetera, et cetera.



A Gateway to an Archaeologist's Paradise—the Buried Past of Our Own Southwest

EXPLORATION

IF THE ONLY purpose of museum field expeditions were to bring back specimens, dead or never alive, for display in large or small glass cases, then the high name of exploration would not be applicable to such endeavor. For to explore is to attempt to discover something previously unknown, whether it be a new species of animal, living or fossilized, or new facts about the life and works of so familiar a friend as the red squirrel—whether it concern the racial origins of the American Indian or of the bird forms of the High Andes and South Seas. To poke into the far corners of the earth may be adventure, but only when one finds out exactly what is in those corners and why, and what is or has been its behavior, significance and relation to other forms—only then does adventure become exploration.

This, be it noted, implies a program—it is like city planning in that the units undertaken from time to time contribute to a total result—must answer some broad, general queries. Programs, however, must



be financed—which constitutes the rub. . . .

Many expeditions go out from the American Museum of Natural History—there have been as many as sixty, large and small, in the field in one year. Some, because of more ample, long-time outside financing, have been able to complete units in comprehensive programs extending over years and attacking fundamental regional problems from all the scientific angles represented by various specialists on the field staffs. . . . Others, and these

the majority, do no less thorough and valuable work while about it, but must do it piecemeal, as opportunity—i.e. money—offers; a bit here and a bit there, out of sequence. Department exploration becomes sporadic and explorers opportunists.

This is the situation when there is no adequate, stabilizing museum fund for exploration, so that recourse must be had to occasional outside gifts which almost invariably are restricted to some specific venture.

The importance of planned, programmed,



Encamped, Mile High, to Study Bird Life on Mount Orizaba

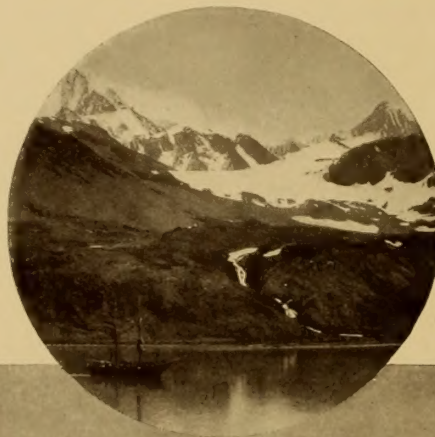
EXPLORATION



The Central Asiatic Expedition in the Gobi Desert of Mongolia

comprehensive projects has no weightier exemplar in American Museum history than the great Jesup North Pacific Expeditions of 1897 to 1903, which studied the coastal tribes of northwestern America and northeastern Asia, endeavoring to determine the connections, racial, cultural and historical, between Asia and the New World. More as by-products than as end results of the work of a distinguished staff and group of American and Siberian collaborators, huge collections filling several halls were amassed. The research conclusions of the staff were published in ten volumes.

(Bottom) Dog Team of Stefánsson-Anderson Arctic Expedition. (Circle) Collecting Antarctic Specimens in South Georgia for the Museum



Thus, at the very roots of civilization upon this continent, was commenced the patient probing of the scientist. . . . There followed a fifteen-year program of successive expeditions to study the vanishing tribes of East and West in woodlands and plains. . . . The Huntington Survey of the tribes and prehistoric ruins of the Southwest lasted for thirteen years and

included a study of five living peoples and fifteen hundred and thirty sites and ruins in four states, covering an area of more than fifty thousand square miles. In the course of these excavations the Museum, through Mr.

EXPLORATION

Huntington's generosity, presented to the United States a now famous ruin near Aztec, New Mexico, which was accepted by our Government and made a national monument.

The recognition of its work, however, which the Museum most values came from an old Indian, who said to the curator-in-chief of anthropology: "Now I pass in peace. You have written down our history. You have put away in a safe place the things of the old people. Our grandchildren can read and see what their ancestors did. Otherwise all



Headed for the Foothills of the Rockies—an Ornithological Expedition. In Circle: On the Deck of the Arcturus, Sorting a Deep Sea Haul

would be lost. It is good that you came before it was too late."

Few realize what a tremendous job American ethnology and archaeology have done in the classic field of our own Southwest, the center of a superior Pueblo people, preceded by others traced back to two or three thousand years before Christ. From successively buried layers of broken pottery in rubbish heaps and from a comparative study of the growth rings in old trees now living and of the corresponding rings in the dead timbers of ancient dwellings, American



Eleven Thousand Feet Up in the Mountains of Chinese Turkestan—Object, Ibex

EXPLORATION

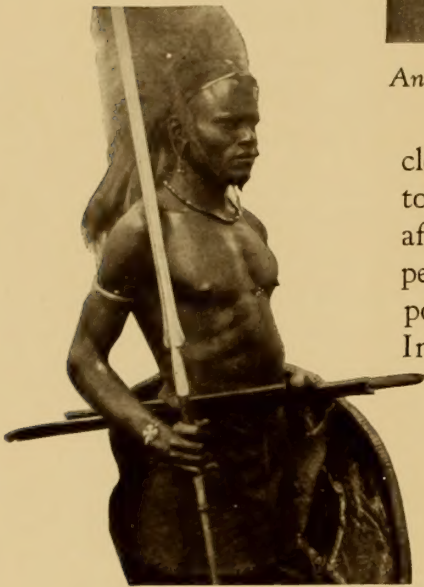
Museum men have devised, or caused the devising of systems for the relative dating of ruins and sequences of cultures the age of which was previously a matter of conjecture. So accurate have these "time



An African Lioness Oblingly Takes Her Own Flashlight Photograph for Martin Johnson

the cliff palaces themselves.

Thus is the pre-history of our own country being laid bare, while staff archaeologists stand ready to try out in Central America and Peru the newer dating methods



Right and Left: Nandi Spearman of

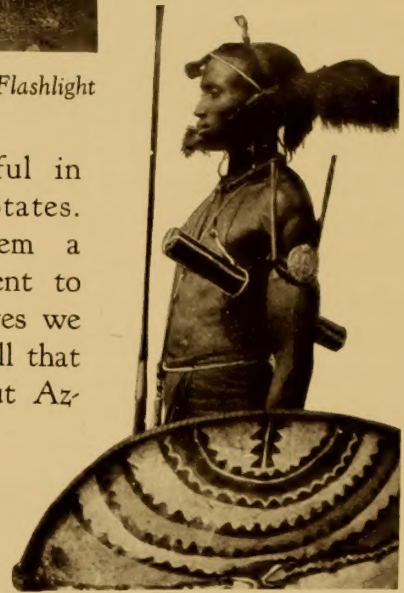
of the ruined cliff houses of Colorado with an authentic realization that he is "upon hallowed ground, where the first wild hunters from Asiatic shores took up their residence, to be succeeded in turn by weavers of baskets, then by raisers of corn and cotton, by skillful potters, domesticators of the turkey, builders of temples and finally the architects" . . . of

clocks" proved, that today, three decades after the Jesup Expeditions, the anthropologist whom the old Indian commended may stand in one

found successful in the United States. This may seem a strange statement to one who believes we already know all that is needful about Az-



Akeley and "The Old Man of Mikeno"



the Type Sculptured by Carl Akeley

tecs, Mayas and Incas from the researches of such scholars as those who have built up the Museum's notable collections from these fields. The truth is stranger still—that the civilization of the ancient Mayas, the Greeks

of America, is now thought to be but a blossom on a far older stem; that the oldest of the preceding "archaic" cultures is not

EXPLORATION

"archaic," but relatively sophisticated in its art techniques.

If the 1930's yield as many far-seeing Jesups and Huntingtons as the 1900's, there is no computing the results of an extension of the Museum's present anthropological program into Central and South America.

* * * *

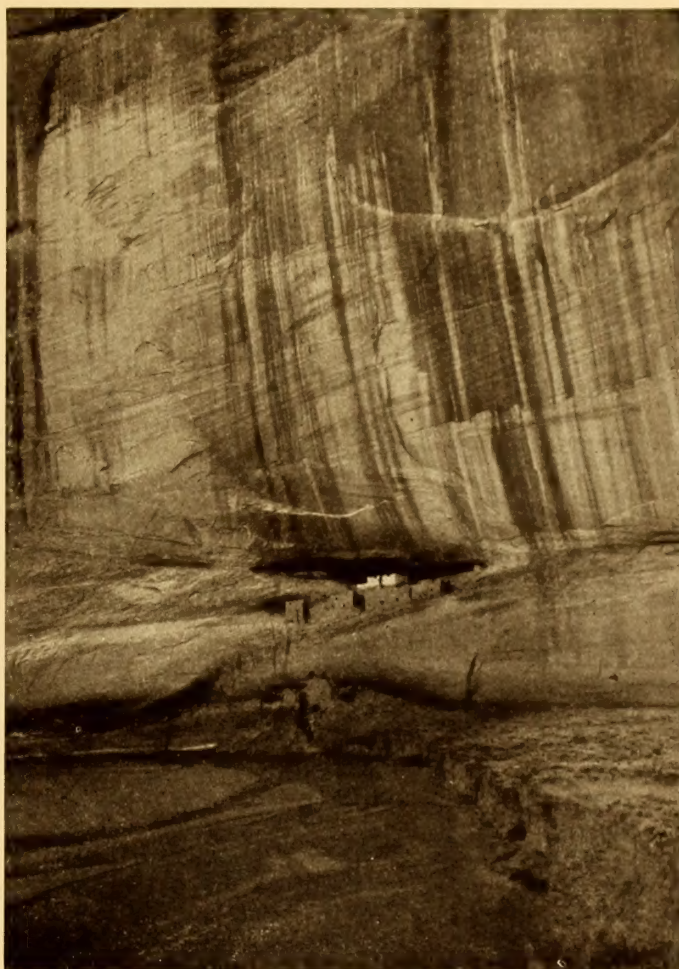
Across the world, in the depths of the Gobi desert of Mongolia, a train of automobiles, supported by a supply caravan of camels, conveys that modern exploration unit, the Central Asiatic Expedition, into the heart of a former continental plain, now a great elevated basin rimmed by mountains. That it is one of the world's oldest land masses was the discovery of the Expedition while testing out the theory of the President of the American Museum that this ancient terrain was the homeland and dispersal center of most of the mammalian life of the globe, including man. All readers of newspapers are familiar with the successive and spectacular fossil finds of this scientific scouting party,

almost military in its organization, which is attacking a seeming waste of sand with all the resources which a full complement of specialists can bring to bear. Here geology,

palaeobotany, palaeontology, archaeology and zoology combine to reconstruct the living past of this dead region. Now in its ninth season, the Expedition is still upturning the fossil evidences of that past as its contribution to the history of life on the earth, and expecting, if it can be maintained in the field, to find in the womb of Mother Asia the early embryonic traces of her last-born, Man. . . .

Important collections have been made on every continent, but the primary aim of the Museum's department of vertebrate palaeontology has

been to gather representative fossil series which should present the historical development of the evolution of land vertebrates in North America, a program so vast that after thirty-nine years of continuous labor it is not yet fully completed. Fossil-bearing strata from Alaska to Mexico have been made



An Older American "White House"—a Cliff Palace of the Ancient Pueblos

EXPLORATION

to yield up the bones of great dinosaurs and extinct mammals—mastodons and titanotheres, little four- and three-toed “horses” and small camels, sabre-toothed tigers and giant ground sloths—all the incredible beasts that roamed our countryside from a million to a hundred and fifty million years ago.

The huge king of the Hall of Dinosaurs, *Tyrannosaurus rex*, first of his name and species, was found entombed in a sandstone hill in the Badlands near Hell Creek, Montana, a hundred and twenty-five miles from a railroad. Sixteen miles of road had to be built, and plows, scrapers and dynamite used to remove him from his bed. Pelvic bones, encased in solid sandstone, weighed four thousand, two hundred and fifty pounds after all surplus rock had been removed down to the bone, and it required a six-horse team to haul this block to the railroad. . . . Seven carloads of bones of great antiquity were shipped into the Museum from the Freezeout Hills of Wyoming—four carloads floated down the canyon of the Red Deer River of Alberta, Canada, on barges. Fossils have been found in Alaskan gold mines and North Carolina coal beds, in California tar pools, Arkansas caves, and in the crater of an extinct volcano in New Mexico. The jaws of a mastodon were excavated at Dyckman Street and Sherman Avenue in New York City. Thanks to the

present use of the airplane for reconnaissance many new fossil areas may be located. . . .

What is the purpose behind this steady, systematic piling up of specimens to replace or supplement old ones now overflowing five exhibition halls and numbers of cavernous study

rooms? Is it that the Museum shall be able to say, with Professor Alfred S. Romer, that its vertebrate palaeontology department, having the largest, finest and most varied collections in the world, has, in less than four decades, “risen to an unchallenged position of leadership in the field?” That it serves as a world center for palaeontological research which can scarcely be undertaken anywhere without reference to this

department’s collections and research publications? The purpose goes even deeper. It is the true determination of the origin, evolution and dispersal of the great animal groups of the earth. . . .

From a study of these fossil finds it has been possible to work out, here in North America, the development of the horse from a small, four-toed denizen of subtropical areas, which was, in fact, not yet a horse, to the present large, one-toed plain-dweller. More, it has been possible to name North America as the theatre of evolution and worldwide dispersal center for the horse and camel families—the chief transport agents of man from primitive time. Confront-



*Out of a Montana Fossil Quarry, En Route to the Museum, a Six-Horse Hitch Hauls the Pelvic Bones of *Tyrannosaurus rex**

EXPLORATION

ing the evidence afforded by the Museum's specimens, particularly its remarkable synoptic series of fossil horse skeletons ranging from an early period in the age of mammals to modern times, Museum research is able to picture the evolution not only of the horse and to a large extent of the camel, but of our own West from a warm, marshy land bordering the great inland sea which is now the Gulf of Mexico, to the elevated dry plains and mountain ridges of the present.

Through palaeontology evolution has received its most impressive proof. Through the study of fossil material it has been possible for the President of this Museum, as founder, curator and builder of this department, to conduct his fundamental researches in former land connections throughout the world. From such studies as these emerge the facts that North and South America were first joined, then separated, then rejoined; that Asia and North America were once joined. These connections have been geologically dated from charting the periods of animal migrations as attested by the fossil sequences found. . . .

For a "dead" science palaeontology contributes to human knowledge exceedingly live data—yet so far has but scratched the earth's concealing surface. . . .

Exploration programs undertaken by or for this Museum are, of course, of many kinds. There is the thorough, systematic work of the department of mammals in South America, in the field with one or more expeditions each year since 1910, whether alone or in association with the Museum's ornithologists—a persistence that has rewarded the Museum with the most varied collection of South American animals to be found anywhere. . . . There is

that stirring venture of two British sportsmen, Arthur S. Vernay and Colonel J. C. Fauntorpe, who set out to make for an American museum the finest selective collection of game animals ever brought together to represent the fauna of India. . . . A fauna fast disappearing, be it noted, because of the spread of cultivated areas, because of disease and the depredations of greedy commercial and amateur hunters. The provincial potentates who assisted the two Englishmen in their scouring of the plains and jungles of India and



Tyrannosaurus rex, King of the Hall of Dinosaurs

Burma were invited to come to America to witness the dedication of the result—South Asiatic Hall, surely the most beautiful museum hall in the world. It is the consummation of the dreams of an architect, a staff of animal sculptors, landscape painters and preparators, Museum officials—and the donors. To the

EXPLORATION

visitor it seems that the silent but expressive inhabitants of the Hall are proud of serving in perpetuity as perfect representatives of their dwindling species.

From India to the High Andes is no great step for American Museum exploration. There, on slopes reaching an altitude as high as 23,000 feet, with banded life zones rising from the Tropical to the Arctic, it has been possible for the bird department to study birds as in a laboratory, since a mountain, with its climate belts, is the world in cross-section. What are the natural laws controlling the distribution of these birds, differing in form according to climatic zones? Whence came their ancestors to populate such "new" mountains as the Andes? . . . What have been the evolutionary changes in species? . . . It seems immensely obliging of Nature thus to permit human science to serve as laboratory assistant while she conducts an intensive biologic experiment on a continental scale.

Simultaneously, in the South Seas, the Whit-

ney Expedition, launched in 1920, is still sailing from island to coral island—many unexplored by science—lying in the scattered groups that make up Polynesia. There is being amassed the largest systematic study collection of South Sea fauna, chiefly birds, ever assembled. The representatives of many a new species and genus have already been described. Usually the size of such prospective new collections is a matter for as much concern to the Museum as rejoicing. Indeed, in this case, even though the collection is to be generously housed in the model Whitney Wing, topped by a skylight aviary for live study specimens, it will still require classification, preparation and years of specialized study—all of which will cost more than the expedition itself. . . .

Cost what these collections and expeditions may, continuing them is an obligation of civilized man, who has set himself the task of finding out what is, what has been, and what will be—the evolutionary history of life and its environment, the earth.



RESEARCH



LET IT BE understood at the outset that, merely for convenience, the subjects of American Museum exploration and research are treated separately here. The notations set down under these two headings could quite as well be transposed.

For example, when the curator of marine life devotes years to a study of coral reefs in different parts of the world—is that not both exploration and research? What is the proper classification for scientific work done in comparative anatomy to determine the exact sequence of body structures from fish to man—when it involves the sending of an investigator to Australia, Greenland and Africa for observations and material? Or, for that matter, merely across the Hudson, where the Museum's chief geologist goes to dig for cross sections of the clays once deposited every year by melting glaciers in the last ice age. From a count of these annual layers of summer and winter sediments it becomes

*Studying the Habits
of Salamanders in
the Laboratory*



possible for him to say: The glaciers over the Hackensack valley took twenty-five hundred years to retreat; those over a portion of the Hudson valley, seven hundred. . . .

Still other pieces of straight Museum research are done in the field, even though it be a near-by field. As before noted, an ichthyologist need go only fifty to sixty miles from his office to bring up deep sea forms for study, and not as far to secure even more interesting fifty-fathom specimens from a narrow, mysterious belt near the outer edge of the Continental Shelf, inhabited neither by deep sea nor shore fishes but by peculiar exotics whose nearest relatives are to be found in the Mediterranean and Pacific. . . .

A backyard serves both as exploration field and as research laboratory for a curator who, if he had lived in the Middle Ages, surely would have been revered as a wizard versed in black magic and acquainted with some of the dark secrets of Nature. Within his microcosm, the world of insects

RESEARCH

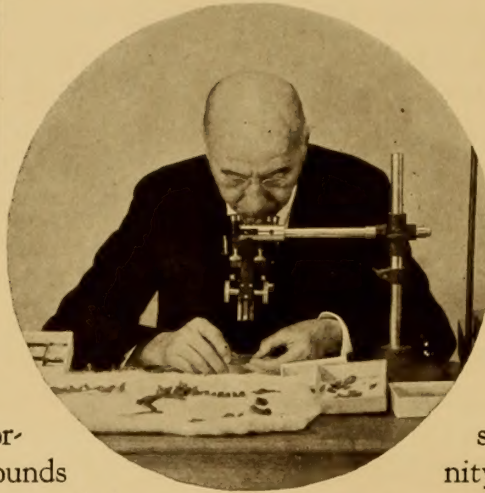


*In a
Glacial Clay Pit*

*Above the Race
Track*

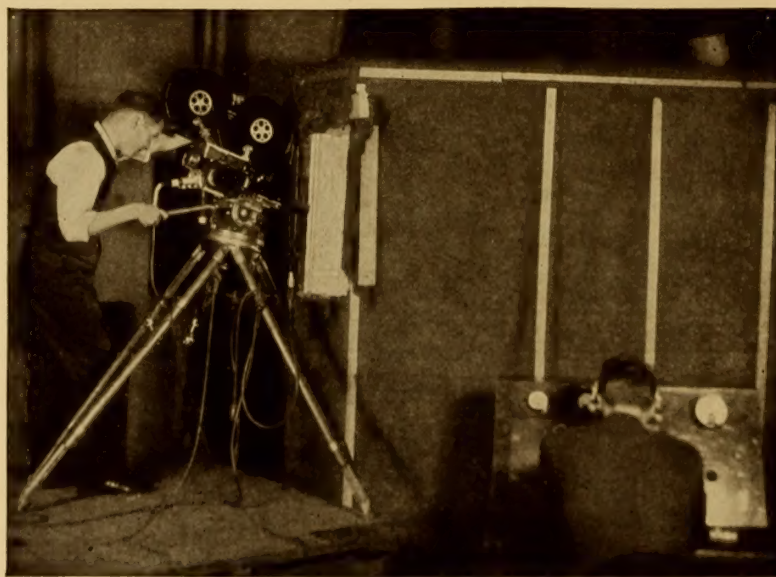


In the Laboratory



(a world of half a million species, or three-fourths of all the species in the animal kingdom), he conducts experiments uncanny in their encroachments upon the borders of the unknown. Insect sounds inaudible to the human ear are recorded with the aid of a movietone amplifier. Ultra-violet rays invisible to man are demonstrated, by a series of subtle studies, to attract insects when reflected from the flowers they frequent. Imagine a detailed scientific monograph analyzing the cricket's chirp, with its range impossible for any human prima donna

*All this Apparatus
Concerns a Cricket
and His Chirp, Re-
corded by Movietone
Amplifier*



fully to hear, much less rival!

The race track is at times the incongruous setting for the research of one Museum authority of scholarly dignity. His old-world politeness must impress even the dazed hostlers who lead horses up and down, or run them, for the "professor" to observe as he lies in the dust or on the roof of a stable—even suspended on a

seat fifty feet in the air—studying and photographing their motions for reproduction in marvellous skeletal mountings. Nowhere else in the world are there motion studies in bone like these, which should be labelled, like sculpture: Man

RESEARCH

Reining in a Rearing Horse—Racing Wolfhound—Sysonby, Champion Race Horse, in Action, et cetera. . . .

A dark, slippery cave in the Missouri Ozarks, inhabited by a species of blind salamander, is the strange scene for one of the labors of a herpetologist bent on discovering whether the young of the species retain the potentiality for sight despite the generations of blind ancestors behind them—a question answered affirmatively by rearing them in the sunlight of the laboratory. . . . Shift the scene for another act to the little island of Komodo in the East Indies and we find a young Trustee of the Museum playing the rôle of St. George for the herpetology department and slaying the largest dragon lizards in the world for a habitat group. . . . Shift again to Haiti and Santo Domingo for still more research. . . .

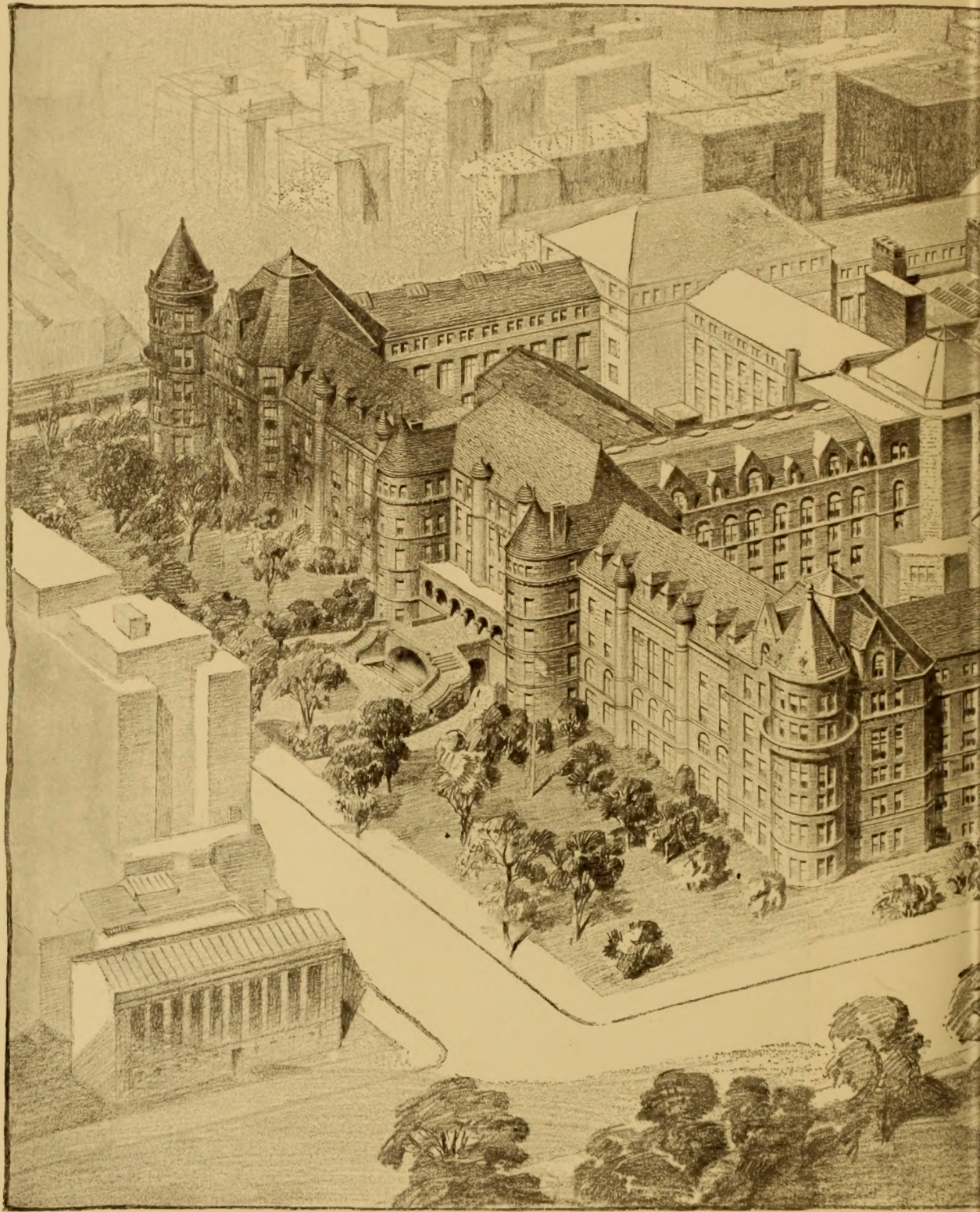


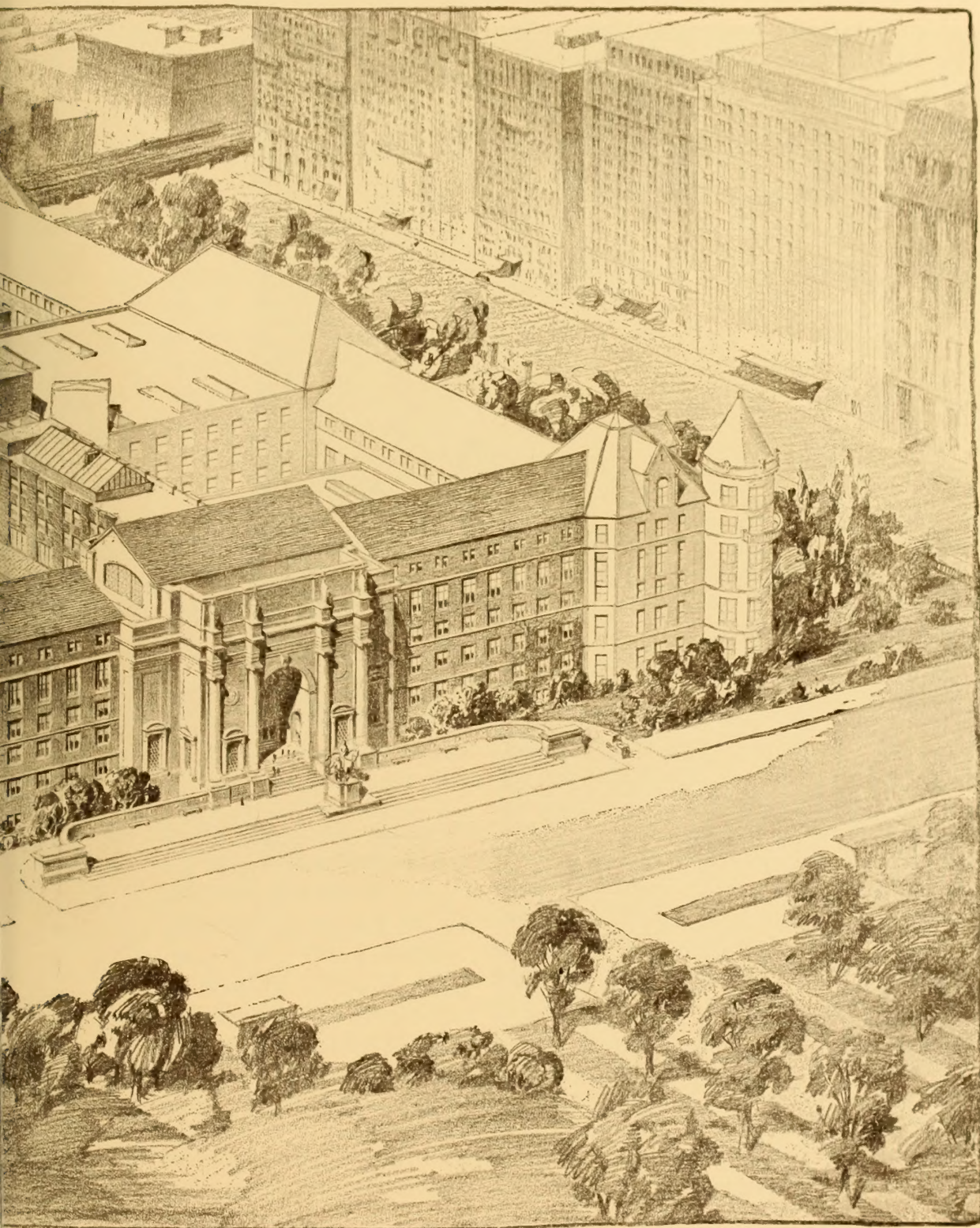
An Iguana Makes His Debut in the Museum



"... a Yellow Primrose Was to Him," But to Insects it is Ultra-Violet in Reflections, as Proved by a Series of Subtle Museum Experiments

There is a kind of Museum research, however, that has come indoors, though it still depends upon expeditions or field work for its live material—indeed, receives its chief impetus from the availability of fresh field specimens assured to it by the work of the great natural history museum of which it is a part. This research has grown out of the American Museum's increasing realization that to prove anything fundamental the newer discoveries in biology—especially in genetics and animal psychology—must be applied to life as it occurs in Nature. It is not enough, any more, for naturalists to discover, describe and classify new forms—even to study their life histories and relations to their environments. Outside of museums, experimental biology has forged ahead and by actual laboratory experiment with the factors of growth and evolution has shown





THE MUSEUM OF THE FUTURE

The American Museum of Natural History as it Will Appear From Above Central Park. The Darker Treatment Represents Units Already Built or Under Construction by the City or the State. The Lighter Portions Indicate Units Which Eventually Will Extend the Museum Over the Entire Area of Manhattan Square



RESEARCH



*Eohippus, the Four-Toed Horse of America's Eocene Period,
Thirty-five to Forty Million Years Ago*

the naturalist the real hereditary units of his species. It has shown that chemical body messengers, such as the internal secretions of endocrine glands, control growth of the body and in large measure reproduction and animal migration. It has demonstrated the origin of instincts—has bred at will new characters, new forms—has reduced phylogeny to an experimental science, controllable by man.

The natural history museum should, of course, be the final authority on questions concerning the kinds of animals in the world, their structure and functions, their past migrations, their origins and their interrelationships with the environment; just as the museum should

be equally well informed on the changes which have occurred in the inorganic materials of the earth and universe. Unfortunately, however, due to lack of funds for adequate department personnel, most museum curators find themselves, in their efforts to pursue lines of research, swamped by field and executive duties, with little time to do more with their material than make it convenient for others to study. This state of affairs could easily result in museums taking a position secondary to universities, colleges, and research foundations in all fundamental biological questions concerning species, origins, or vital processes which they, as natural history authorities, are obligated to know.

RESEARCH

Foreseeing this, the Trustees of the American Museum have taken a great forward step in Museum development by creating a sub-department of experimental biology which lacks only adequate financing, by means of endowment, to extend its work beyond the one department with which it is now, for convenience, associated and become the servant of all departments. The next step will be the securing of additional biological investigators disciplined by years of university study in experimental evolution, cell structure and general physiology, who shall be peculiarly fitted to assist and collaborate in problems confronting department research workers.

Already, in a scant three years of work, the new department of experimental biology has published results of general biological significance—has made important contributions to the knowledge of the hormones which control the breeding cycles of animals, also the effect of the thyroid secretions upon growth. Some of the factors controlling the form of teeth and the color pattern of animals have been discovered. Though these problems so far have been worked out only with reptiles and amphibians, the conclusions are of value to a general understanding of the

processes producing the infinite variety of form and color found in Nature.

Nature is a strange and subtle Sphinx, but man is making so bold as to question her—not generally, but specifically, under a third degree. . . . Under what stimuli do birds migrate? Exactly what makes newly hatched turtles without ancestral memory crawl to the sea, or fish and lizards change color like kaleidoscopes? What is the sensory apparatus of the robin that it can hear an earthworm in its burrow—of the male moth that flies through a forest at



Pedal Extremities, Ancient and Modern—Without Research No Giant Saurian of the Past Could be Restored

RESEARCH

night guided only by the odors of the female—of the bat which avoids obstructing branches by analyzing the echoes of its flight? What are the biological laws behind the organization of animal colonies—of the different types of animal food chains in which one form is food for the next, in sequence?

For any animal to be thoroughly known, it must be studied from many aspects, anatomical, physiological and psychological. . . . As early as 500 B.C., Hanno, the Carthaginian navigator, brought gorilla skins back from his memorable coasting voyage along Africa, and these skins were displayed in the Temple of Melkarth, the museum of that day. Many explorers have since that time collected trophies of this much misunderstood primate. However, it remained for Yale research to go into the field to learn



Born in the Museum, Under the Sign of Scorpio

something of gorilla psychology under natural conditions, and an expedition, under the joint auspices of the departments of comparative anatomy of the American Museum and the College of Physicians and

Surgeons of Columbia University, is now in Africa endeavoring to complete the Museum's anatomical data. . . .

*Three Diverse Subjects of
Museum Research*



A museum, in short, is not a mere natural history exposition for sightseers, in which bits of Nature in great number and variety are beautifully reproduced; it is not only an institution for making man aware of the world in which he lives; it has the higher purpose of discovering the laws which have regulated life from the remotest ages. But this great work depends for its support on the amount of vision and enlightened self-interest active in the Museum's constituency, the American public.



PREPARATION

BEHIND screens bearing the provocative sign, "Not Open to the Public," is the central atelier of the Museum's department of preparation, vested with the Jehovah-like function of breathing life into dead bones and dry skins.

Hanging on a frame in this huge, high-ceilinged studio, full of artists and craftsmen at work, are the tawny skins of lions and tigers, soft inside as chamois from tanning. Over near a window labors the besmoked chief of preparation, a former pupil of Carl Akeley and sculptor of repute, whose bronze of an African rhino is said never to have left Roosevelt's library table. He is modelling in clay an African antelope, a delicate, nervous creature with veins standing out in relief along the face and limbs. A tinier clay model, innumerable pencil sketches and measurements made by him while exploring in Africa, field photographs of living antelopes, and



the skeleton itself, inside the clay, all serve to guide him. From time to time he tries on the skin as a tailor might, except that he is more interested in knowing whether the body fits the skin than vice versa. Of that body a plaster mold will be made and,

inside the halves of the mold, will be built up, in layers of sized fabric, papier maché and wire mesh, a substitute body, hollow, light and thin, to be put together and finally covered with the skin as a finished mount. This, however, is not taxidermy, but sculpture. The manikin and final skin covering will show every muscle contour and ripple sculptured freehand by the artist.

Just off the studio a little lighted room serves as a complete model of the great Akeley African Hall to be—the dream for which he gave years of his life, dying of exhaustion from continued overwork collecting specimens on elephant trails and in the fastnesses of the mountain gorilla. Entering



Almost Alive—Thanks to the Department of Preparation

PREPARATION



*The Man Who Transformed the Profession of Taxidermy
into the Fine Art of Animal Sculpture—
Akeley in his Gorilla Camp*

this model hall one sees in perfect miniature
a sequenced panorama of Africa—animals

against landscape backgrounds ranging from
the cold, volcanic peaks of the gorilla coun-
try to the hot, russet sands and leafage of
the plains. Down the center of the room
tramples a herd of mounted elephants; in the
van, Akeley's big bull and a cow and calf shot
by Theodore Roosevelt and Kermit. Between
the glowing wall groups stand, as sentinels, the
dark, enigmatic sculptured figures of African
natives. A whole country here—animals,
terrain, people—to be reproduced in the large
by the labor of nearly a hundred artists and
artisans—sculptors, landscape and animal
painters, "accessory men" responsible for realis-
tic foregrounds, carpenters, masons, metal
workers. . . .

A word about those artists with the modest



*The
Giant
Manta
—
Finishing
the Cast
for the
Hall of
Fishes*

PREPARATION

title of "accessory men." The leopard group in South Asiatic Hall presents a fairly complete example of their work. . . . The scene is a cool, rocky glen in the jungles of Mysore. The very atmosphere seems impregnated with moisture—the moss on the boulders, the darker damp earth edging a trickle of water—a clump of dewy orchids in a tree crotch. Flanged roots of the largest of three trees hung with creepers seem to be exploring for water, as does a broad, umbellated rock plant. There are two leopards, one crouched on a boulder with a dead peacock under his paw. . . . Now, aside from the painted background, everything in that group, except the leopards, the peacock, the creepers and a moray tree from India, is the work of the



Modelling a Clay Manikin or Perfecting a Huge Mount—All in the Day's Work to the Skilled Preparator-Artist

accessory men. So incredibly real is the setting that one feels like kicking the rocks to see



"Vested with the Jehovah-like Function of Breathing Life"—Even into an Elephant

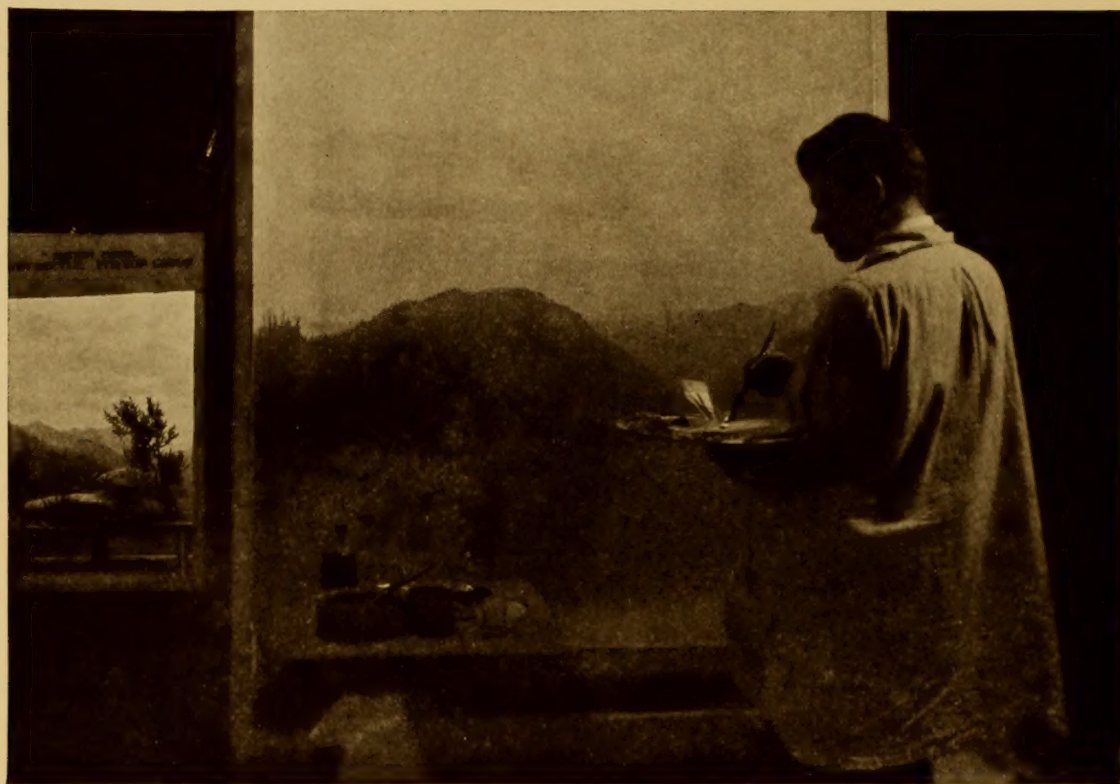
PREPARATION



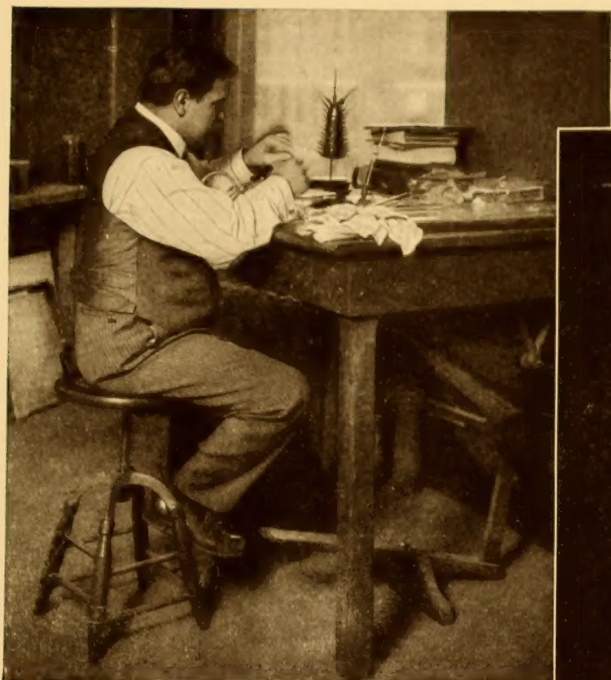
The
 Museum
 Artist in
 Field and
 Studio

—
 In the Depths
 of Africa
 Recording
 Landscapes for
 Proposed
 Museum
 Animal
 Groups

In the
 Museum
 —
 Painting the
 Actual
 Background
 of a
 Small
 Group



PREPARATION



*Performing Miracles in Glass
(Not a Venetian Liqueur Holder but a Bell Animalcule of
Microscopic Size)*

Below: Reconstructing the Head of a Titanother



a sensitive-fingered Japanese, is making, with an occasional glance at photographs and color sketches, the hair-like stamens for the frail purple clusters of some small wild legume of Asia. In his glass "hothouse" are cactus and Alpine phlox, dogwood and pitcher plant blooming sociably together in the same indoor climate. Atop a shelf are swathed cotton plants destined for the Hall of Insect Life and showing the life history of the boll weevil.

Across the hall in other preparation quarters a sculptor has just finished for the comparative anatomy and anthropology departments a most public-spirited wax man who is allowing his internal machinery to be exposed for the benefit of an interested world! Next door a preparator is mounting a robin for a school loan exhibit. One of his recent jobs was

whether they are not genuine, after all. Only scientific field work on the spot and the most studious skill at home can produce such a composite result.

Glimpses into the accessory laboratories give a hint of methods: From a formaldehyde solution four workers extract the actual branch of a West African acacia tree, drawing it, making plaster leaf molds and turning out quantities of wax leaves to be colored, attached to "twigs" and "branches," and fastened to real tree trunks. . . . Another artist,



PREPARATION



An "Accessory Man" in his Museum "Hothouse" of Waxen Blossoms

to help populate the replica of a whole Panamanian forest with some seventy iridescent feathered residents.

. . . . No preparator is ever quite certain what he will be called upon to do next. . . . One day, for instance, an obliging young sperm whale blundered into New York Harbor, was killed in a Brooklyn canal, hauled up onto a pier by the citizenry and at once carted to the American

o-o

Not a Scene in Nature, Not Even a Habitat Group—Merely a Two-foot Wax Working Model



Museum to be dumped bodily in the huge, unopened Hall of Ocean Life. It was as if he had swum in to give himself to science. Certainly both scientists and preparators fell upon him in the name of science and rent him from flipper to fluke. Like Shakespeare's shipwrecked mariner . . . of his bones were data made! He suffered a sea change into the life-sized model which now hangs in the Hall.

From whales to pond animalcules invisible to the naked eye is a difference involving infinity—and several Museum floors. In one of the cramped, top-floor workrooms of the department of marine life sits a placid glassblower, born in the Black Forest of Germany, who is serenely indifferent to his fame as the fashioner of unsurpassed marvels in glass sometimes made the objects of pilgrimage by foreign visitors who have heard nothing else about the American Museum of Natural History except that it houses them.

For twenty-five years, under the scientific

PREPARATION



A table ranged with rows of pill boxes full of sand and minute crumbles of bone is the scene of the labors of another preparator artist, this time in the medium of fossils. On that table were once assembled some of the thousands of fragments now welded into the seemingly perfect skeleton of *Hipparion whitneyi*, the three-toed desert horse of America's

American Egrets—Not an Inness Painting but a Museum Habitat Group

Below: Deep Sea Pirates in the Dark Room of the Hall of Fishes

tutelage of the curator, he has sat at his workbench before a gas flame capped by nozzles of his own making and, with fewer tools than he has fingers on his skilled hands, has worked miracles. They are to be seen in Darwin Hall—for example, the microscopic inhabitants of a cubic inch of pond water, magnified a million times to show every intricacy of internal structure. Bounded by the rim of a magnifying glass, enlarged to scale, is seen a watery world of translucent green, with myriads of strange, exquisite little creatures clinging to silvery reeds and shaken by the same impulses of hunger and fear, belligerence and possessiveness, that compel us.

Like a collection of crown jewels are the near-by cases of fragile, crystalline sea and pond forms, delicately colored or waxed by other department artists. For marine groups one of them paints, from a diving bell, backgrounds depicting undersea coral thickets and sponge groves. . . .



PREPARATION

Miocene period. . . . Now, under a strong light, with the aid of a compound microscope, he is restoring the tiny hip bones of a little Triassic relative of both dinosaurs and phytosaurs, about a hundred and twenty million years old and never before discovered. So rare was this find that the whole side of a hill was swept down and sifted through a fly screen in an effort to salvage every least fragment. When the parts are pieced together they may afford evidence that a chapter in the science of morphology, or form as we know it, should be rewritten. . . .

One classic instance of the value of thorough and accurate preparation of exhibits concerns the famous eighteen-foot model of the Copper Queen Mine of Bisbee, Arizona, in Geology Hall. Examination of this model when completed showed the company engineers that various pockets of ore which had been overlooked in thirty-five years of mining operations could be readily mined. . . .



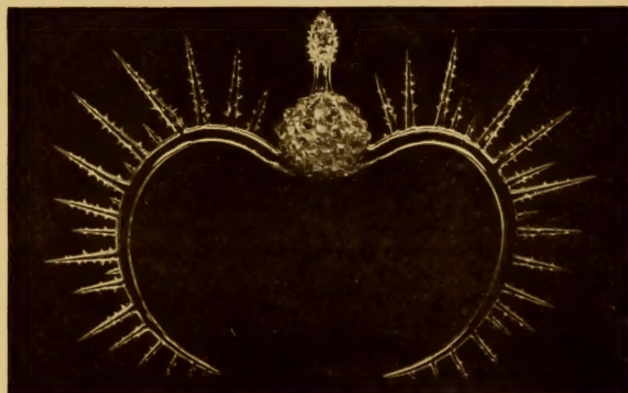
A Cup of Jade Inlaid with Gold, Diamonds and Rubies—From the Morgan Hall of Minerals and Gems

This tireless work of preparation may be glimpsed, without going behind scenes, in its results—the exhibits. . . . A wandering scribe from a popular weekly was once deeply intrigued by the hint of ingenious mechanism behind the intermittent lighting of the bodies of little deep-sea dragons in the dark room of Fish Hall. All that trouble simply to give the fleeting illusion of phosphorescence—but how beautiful the illusion!

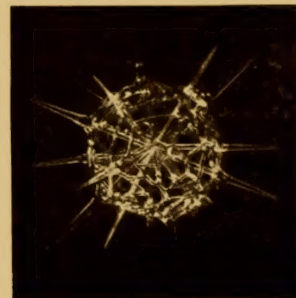
Casual visitors hang in delight over the cases of jewels and carved precious objects in the resplendent Morgan Hall of Minerals and Gems, but students

seek its models and specimen charts which, however complex, clearly tell what an atom is, an element, a mineral, a crystal. . . . In three other great teaching halls, those of insect, marine and reptilian life, the originality and cleverness of the mechanical means

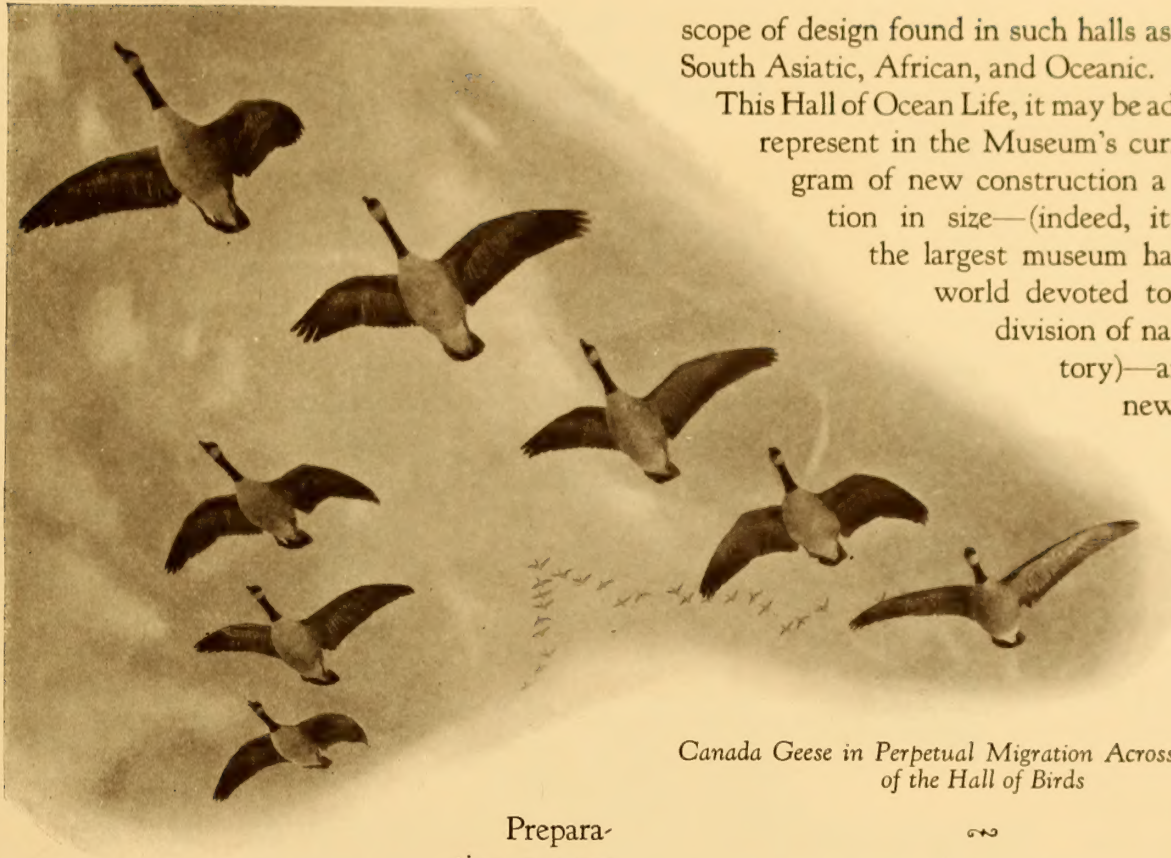
used to illustrate fundamental principles of biology and evolution are especially striking.



"Like Collections of Crown Jewels are the Cases of Fragile, Crystalline Sea and Pond Forms"



PREPARATION



scope of design found in such halls as the new South Asiatic, African, and Oceanic.

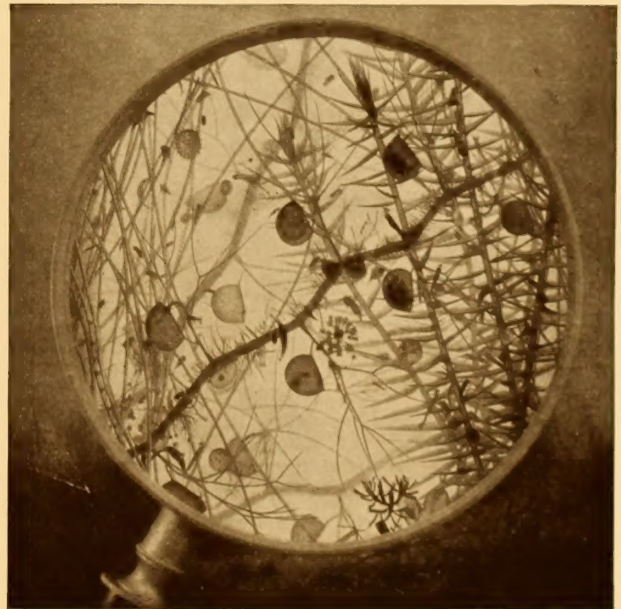
This Hall of Ocean Life, it may be added, will represent in the Museum's current program of new construction a culmination in size—(indeed, it will be the largest museum hall in the world devoted to a single division of natural history)—and also a new peak in breadth

Canada Geese in Perpetual Migration Across the Dome of the Hall of Birds

Preparation, as may be gathered from all that has been said, has brought Museum exhibition out of the old, stiffly mounted single-specimen class into, first, the day of the habitat group, a section of the animal, or even inorganic world transported almost bodily from the field, and, second, the era of the unified exhibition hall, where every group, every exhibit, every decorative detail is made part of a whole—a veritable visual textbook.

It is notable that the first Museum hall to introduce the pioneer principle of habitat grouping also presaged the modern ideal of the hall as a total concept. The Hall of North American Birds, in its sweeping pictorial representation of the typical bird life of a continent, as shown in its chief climate zones and environments, lacks only the architectural unity and

The Microscopic World of Pond Life—Enlarged a Million Times by the Skill of the Glassblower



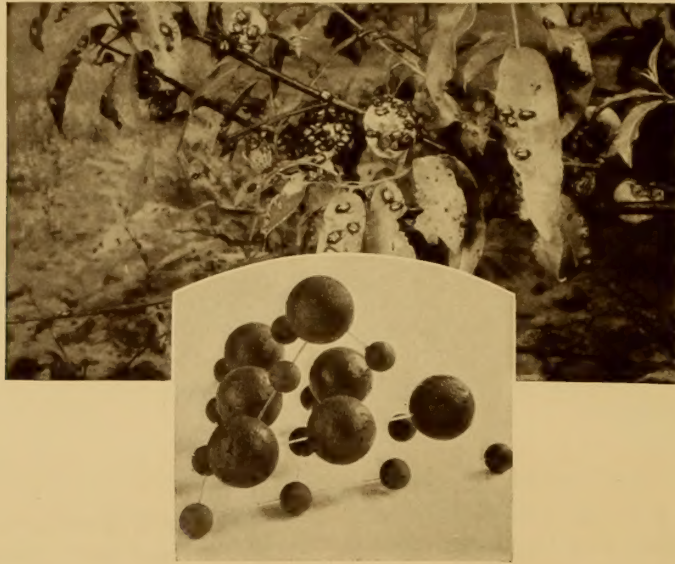
PREPARATION

and beauty of groups and murals used in combination.

These exhibition halls of the Museum, be it remembered, not only appeal to a sense of beauty through their perfect reproduction of Nature's forms, but they teach Nature's

lessons to a million beholders a year. It is significance of subject matter, pleasurably introduced by beauty of illustration, which arrests public attention and entitles the Museum to public support as a university at large for all people—the interpreter of science to all comers.

Exhibits That Educate. From the Ravages of the Japanese Beetle to the Atomic Composition of a Crystal of Salt—There is Usually a Museum Group or Model to Tell the Story



EDUCATION



HAVE YOU, the Museum inquires, a well suppressed desire to travel and study strange places? Then here, like open books, are Africa and India, Siberia and our own Southwest. . . . Are you curious to know what revolutions of thought are occurring in the fields of biology, the inorganic sciences, anthropology? Then here are astronomy, entomology and bird lore, geology and marine life, fishes, reptiles and mammals, minerals and fossils ranging from sea shells to dinosaurs—here are demonstrated the principles of evolution, heredity, behavior—the atomic structure of matter—the mechanism of the human body.

. . . Special educational guides will take you to all sorts of places and open up all sorts of vistas, within the confines of one building. In fact, only by wearing a blindfold and stopping your ears could you be led through any section of this Museum without learning something surprising and

thrilling—the most surprising, perhaps, that even the blind and deaf here hold classes in natural history! . . . Here are lectures, motion pictures of limitless variety and a natural history library with a staff ready to outline courses of reading on almost any live topic dealing with man or nature. . . .

Are you merely a thwarted fisherman who never gets away from the office? The Zane Grey game fish collection and this year's record of rod and reel catches will brush you up on your subject. . . . In default of hunting trips that remain pipe dreams, you owe yourself the vicarious adventure of big game hunting on

every continent within Museum walls.

Perhaps your hobby is photography . . . or collecting arrow heads, or butterflies . . . or weaving baskets? Some of the finest animal photographs in America are assembled in a room of the department of mammals. . . . Not a day passes that some fossil, Indian



More than 200,000 People Annually Attend the Museum's Public Lectures and Motion Pictures

EDUCATION



The Reading Room. Artists, Advertisers, Authors, Editors, Research Workers and Students—These and Countless Others Frequent the Museum Library

artifact, bird, plant, rock, insect, fish, reptile, or fragment of meteorite is not identified for somebody by a Museum official. . . . A worker, amateur or professional, in pottery, metals, textiles, jewelry or basketry may copy the masterpieces of Inca, Maya, Aztec, and North American cultures. He may study the unsurpassed weaving techniques of Peruvian cloths and of baskets that have given a name to an early, little-known people of our United States—the Basket Makers of perhaps 2000 B.C. From tombs millennial in age, these relics have emerged with colors and designs as fresh and clear as those in shop windows today—shop windows, be it added, full of

copies or adaptations from the originals.

Some years ago, when the primitive industrial and fine arts of North, Central and South America, as well as other parts of the world, were even less known and understood by us than now, the Museum, in cooperation with twenty-six industrial firms, held an epoch-making joint exposition of ancient and applied art, filling three halls converted for the purpose. Textile manufacturers, furriers, designers of costumes and fabrics, dealers in art objects and women's wear participated. Primitive looms and modern power looms were shown in actual operation. Artists, craftsmen and laymen came by hundreds to



A Million Votaries a Year Seek This Temple of Science. Contacts with Students of Schools, Colleges and Universities Number More than 12,000,000 Annually

EDUCATION

note and observe. This pioneer museum "Exhibition of Industrial Art in Textiles and Costumes" had as its avowed object "creating a national art" drawn mainly from designs and techniques native to the Western Hemisphere. Its success is believed to have exerted an influence not only on contemporary craftsmanship but on the subsequent policies of at least two large art museums of Greater New York in making some of their store of material much more available to industry. . . .

Artists, sculptors, Indian painters, illustrators, advertising men, technical and magazine editors, writers, research workers and students—these are but a few of the specialists frequenting the Library

and photographic department and haunting the offices of curators in search of information. A

seven months' record of visitors kept by the curator of ornithology in a visitors' book showed his working time daily broken into by calls ranging from three minutes to ten hours, many of which could have been shunted off to assistants—had he had the assistants!

Callers varied from a Japanese prince and the most eminent of British biologists to the South American mule dealer who helped outfit his last expedition. . . . The curator of minerals shows a record for last year of eleven thousand, four hundred and seventy-four persons who came to study his



Art Students and Workers, Amateur and Professional, in Pottery, Metals, Textiles, Jewelry and Basketry Come Daily to Copy the Masterpieces of Inca, Maya, Aztec and North American Cultures

four persons collections.



EDUCATION



The School Nature League Room, a Model for Public Schools, is a Zoo-Museum in Itself

copy the remainder of his life, was started on the road to travel and training and encouraged to become an ardent amateur entomologist.

It was in connection

Out of contacts with curators sparks are struck in many sorts of people. There is the young Russian boy, frequently found behind scenes, who has spent half of his two years in this country collecting and classifying beetles under the wing of the insect department. To him the Museum that has helped him epitomizes America. Judging by the excellence of his work, he may become a good naturalist. . . . A retired doctor, desirous of a pursuit to oc-

with an insect experiment station that the famous Nature Trails idea, which has now spread all over this country and abroad, was first crystallized by a Museum curator. One hundred and eighty-six thousand people last year visited the American Museum's Nature



This Way to the Museum's Nature Trails and Trailside Museum at Bear Mountain!

EDUCATION

What is a Mineral? These Children Are Finding Out

~

Trails—botanical, zoological, geological and historical—and its Trail-side Museum at Bear Mountain in the Palisades Interstate Park. In this center for tourists and summer camps, children and adults make a holiday of learning the structure of rocks and the habits of plants and animals by seeing them in relation to their environment.

The astronomy department, one of the Museum's youngest, has made in five years' time



an astonishing record in organizing public interest in the subject. Two large associations, one of adult amateurs numbering a thousand members and one of young people numbering sixteen hundred, have, through department initiative, been formed to meet at the Museum

and pursue, respectively, lecture courses given by eminent astronomers and group instruction under the department of education. . . . Museum astronomy, housed in

~

*Impressions of the Earth
Blind Children and
Sight Conservation
Groups Are Taught
at the Museum*



EDUCATION

makeshift quarters and struggling to achieve a hall of its own, yet presents one of the most instructive and beautiful of exhibits, in addition to the stirring spectacle of youngsters making telescopes and star charts, conducting their own scientific journal and club meetings, in an enthusiasm for study of our universe not surpassed by their older colleagues.

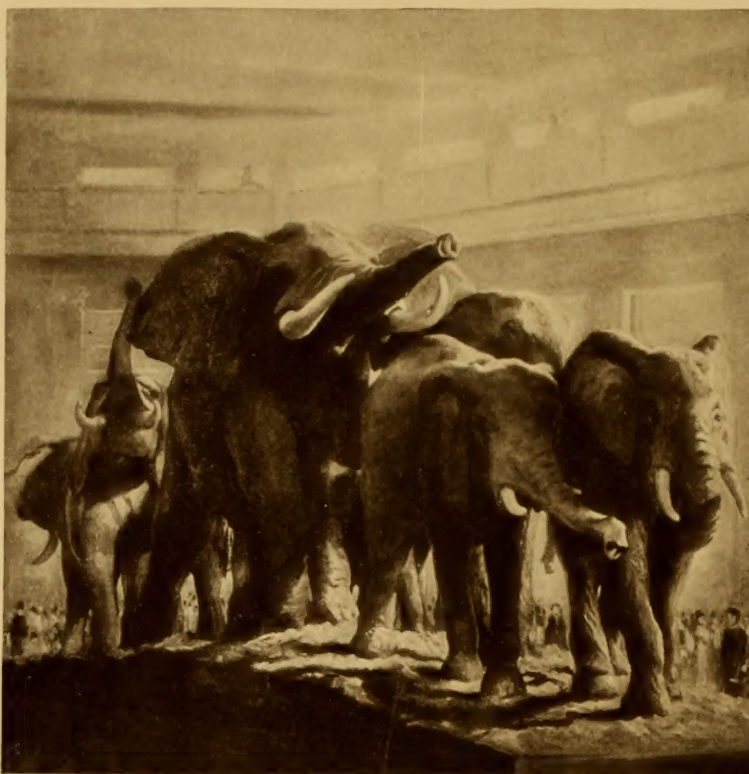
A wider audience than can be reached by any single department of the Museum is secured by its publications, scientific and popular. These are, in the first place, the Bulletin and Novitates, the Memoir series and the Anthropological Papers which report the findings of Museum research; monographs dealing exhaustively with special fields; and such summaries of knowledge as the Dean Bibliography of Fishes. Among the popular publications are the Museum's magazine, "Natural History," and its guide leaflets and handbooks. "Natural History" six times a year takes to Museum members throughout the Union and sixty-six foreign countries articles by explorers, travelers, and scientific authorities both inside and outside of the Museum. Some of the Museum

handbooks are used as text books by colleges and universities. In addition, there is no way of estimating what has been the influence upon the trend of public interest here and abroad of

the thousands of copies of text books, reference works and popular writings of American Museum curators.

Declares the President of the Museum; "It is not enough for scientists to know; it is important that *people* should know." Hence, though he has spent a lifetime in the production of monumental scientific works—

one of which required twenty-nine years for completion of research and publication—we find Henry Fairfield Osborn's "Men of the Old Stone Age" (in its "thirteenth printing, new and popular edition") listed among the best non-fiction sellers of its year. While preparing his major contributions to technical science, which have been based upon and have summarized Museum research, he has found time to become one of the foremost interpreters of scientific thought to the man in the street. . . . Theodore Roosevelt thus evaluated his work: "His exhaustive and many-sided knowledge, his



A Cover Subject from "Natural History," the Museum Magazine

EDUCATION

long scientific training, his natural insight, and his singularly just and fair temper, enable him to give us the first full, clear and critical presentation and interpretation of all that has been discovered and soundly determined since Darwin wrote 'The Descent of Man.' "

Who shall say that this is not education in its broadest sense?

Education is too commonly considered a prerogative of the young. The average notion seems to be that aside from spare-moment reading and an occasional lecture

or concert, we have time only to make a living or manage a house, play a little golf or bridge or both, and educate our children. Unlike them, we have had our chance at an education; for us it is all over and done with.

To which the Museum offers an emphatic No. . . . Here is a place where without



"Birds Useful to Man," One of the Museum's Circulating School Nature Study Collections

expense to you and in your spare time the essentials of a current education may be had—and pleurably.

In its specific sense, education in the Museum is divided between the general public, teachers and higher students, and the pupils of elementary and high schools. The thirteen

universities and colleges which use the Museum in some way as an extension field for the work of graduate and undergraduate students offer instances of such close cooperation as that between Columbia University and the department of comparative anatomy, in which the curator, holding a chair in the University, gives three

A Museum Press

Publications, Technical and Popular, Give Worldwide Distribution to Museum Exploration and Research



EDUCATION

graduate courses at the Museum, where all the research by Ph.D. candidates is done on Museum material. . . . Expansion of special work with college and university students, using the exhibition halls and study collections of the Museum, is now a definite project which depends upon the securing of adequate endowment. . . . These study collections, be it said, out of sight of the visitor while available to the student, are like the hidden portion of the iceberg—nine-tenths submerged and only one-tenth on exhibition.

EDUCATIONAL service to the public schools of Greater New York was begun in 1880 by Albert S. Bickmore, superintendent of the Museum, one of its founders, and first curator of a department of education officially established in 1884. First under State and subsequently under City auspices, the department has from the beginning served the City's educational system.

This work, inaugurated for the instruction of teachers, has, under its present curator-in-chief, who is also director of the Museum, expanded enormously to include the million children in more than six hundred schools of the City.

"It is obvious," says the curator-in-chief, "that through its department of education the Museum comes in contact with greater numbers than through any other channel, because of the variety and extent of its school service. It would be impossible to over-estimate its value to the thousands of city children who have little opportunity to see the great outdoors. The country dweller can hardly real-

ize the restricted environment of many city children. Their knowledge of Nature is limited to the dog, the cat, and perhaps the horse. The vegetable market and pushcart represent their acquaintance with growing things. . . ."

Multiply that city child by a million and at once grant the validity of the plea of the Museum's educational department for more money for duplicate lantern slides and study collections—photographs and photographers—motion picture films for classroom showing—guides and lecturers to handle the hordes of children thronging the Museum and its auditorium and lecture halls.

* * * *

Education, as the Museum conceives it, means giving an individual, whether child, college student, teacher or layman, a rounded conception of the Cosmos and his place in it. The difficulty is that cosmic conceptions do not stand still for us—they grow by accretion of newly discovered fact. The discoveries and conquests of natural science have brought about such developments in thought during the past

century that they should be known to all persons of liberal culture. To continue to bring new facts and concepts to the public is one of the Museum's responsibilities. The hitch in the program is that the de-

mands on the general funds are such that exhibits of late discoveries and demonstrations of research results must depend on haphazard outside financing or wait indefinitely. Meanwhile the Museum's whole educational policy suffers setbacks from the simple lack of that commonplace commodity—money.



PLANS, PROJECTS AND PIPE DREAMS



WHY SHOULD the work of a great educational institution like the American Museum of Natural History be hobbled and handicapped by a constant concern for the wherewithal with which to make even ordinary progress?

The only permanent answer is endowment—more endowment than the Museum has.

Endowment means a stable foundation, not only for the daily work of departments at present severely hampered, but also for those plans and projects now impossible except as curators' pipe dreams.

Not since the war has Museum income been sufficient to meet rising costs and spare enough besides for any but the most indispensable department work in field and laboratory.

For example:

The geology department urgently needs funds for displaying the economic phases of its subject, with exhibits of mining methods and the uses of coal, oil, gas, salt, sulphur, lead, zinc and mineral products in general.

The department of mammals has, to date, been unable to renovate an old hall and thus relieve an unfairness to our own North American mammals, many nearing extinction, by giving them as adequate and beautiful display

as that for the mammals of Africa, India and other seemingly more glamorous lands.

The bird department, in common with most of the others, has been waiting long for additional field research workers, for assistants to follow up current research on material in hand, and for money to carry the results of this research through the Museum press. "More research workers" is also the urgent plea of the department of experimental biology. . . .

In wall cases flanking some of the related anthropological displays is a partly finished group of ingenious exhibits in comparative anatomy which there is no money to complete. Charts of the models proposed show, for instance, Man as an Engine, Man as a Physical and Chemical Laboratory, The Human Face, from Fish to Man.

A laboratory for the study of live insects is the need of the department of insect life, whose present exhibits of live insects give so much added interest to its ordered collections, arranged in veritable textbook sequence.

A field laboratory for marine research in one of the established biological experiment stations, where the Museum can be continuously represented, is the annual request—as yet impossible of fulfilment—of the department of marine life. As for the fish department, there is a

PLANS, PROJECTS AND PIPE DREAMS

great open space outside its dark room of luminescent deep sea forms, which, it is hoped, may be filled with an exhibit of Hawaiian fishes; while elsewhere a section awaits an up-to-the-minute exhibit on aërodynamics—a comparative study of the motions of airplanes and flying fish.

Continuous motion picture machines which aspire to tell visually the stories and lessons of habitat groups and teaching exhibits—these, and funds to form a Junior Naturalists' Club, make up the hopeful requisition of the department of education upon a too-depleted Museum treasury.

* * * *

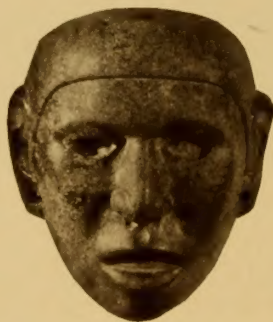
Pipe dreams, perhaps, but how well worth the dreaming! . . . An unplumbed treasure vault for science is a certain island cave in the Mediterranean—shelter for thousands of years of successive peoples, who have left in pottery and in metal and stone implements a stratified record of man's slow ascent from a time believed to be palaeolithic. It would cost little to excavate this cave floor, layer by layer, with the glorified vacuum cleaner which one practical-minded curator would take to the site. But here, too, the lack of a few thousand dollars frustrates the development of what might prove to be a more important continuous register of the human race than any yet uncovered.

To set up the universe in the Museum is the pet desire of another curator! However, that desire may be expressed in one practical word, *planetarium*. Germany has many, Chicago one, Philadelphia one—each the gift of a philanthropist. The Museum's young astronomy department wants one for the millions living in or visiting New York. This new in-

strument of education, virtually without parallel in any branch of learning, is an almost incredible invention—a sublimated stereopticon which projects luminously upon a huge dome, for hundreds of spectators at a time, a moving picture of the heavens. By its use the astronomical bodies can be seen revolving in their orbits at an accelerated pace, or halted in the relative positions they have assumed, or will assume, at any given moment from the time of Joshua up to the most remote future day!

In cramped glass cases in the department of Mexican and Central American archaeology lie, jumbled together for lack of space, exquisite Aztec, Mayan and other potteries, sculptures and carvings, any one of which, in a proper individual setting, would bring forth gasps of appreciation. Such settings—forming a true shrine to the early cultures of the New World—are planned against a day of plenty. Meanwhile, in the cruelly confining cases—only one of which, by way of demonstration, shows what might be done with a little taste and money—lie hundreds of pieces of rare pottery, hundreds of small, expressive terra cotta figurines of children and adults grave and jocose, wistful and grotesque, fairly pleading for the notice and appreciation due them. They are like little voices crying out from the clay of the past to heedless modern Americans to pause and hear what they have to tell of our own native civilizations. . . .

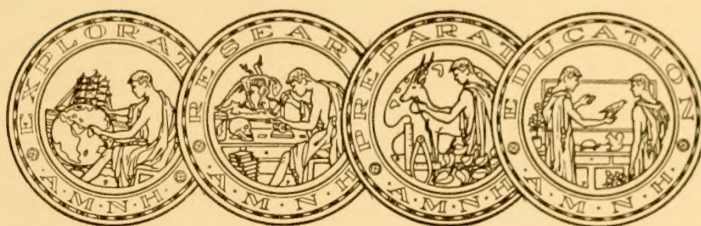
Why should such eminently sound plans and projects remain pipe dreams? There are so many of them that command attention—at least ten to every curator. An endowment great enough to mother them all is the basic need of the American Museum of Natural History.



WHY TEN MILLION DOLLARS?

ALTHOUGH the building needs of the American Museum are being splendidly met by City and State, annual public support of the Museum continues to fall far short of even the routine requirements. For example, only heavy emergency contributions by Trustees have prevented discharge of many employees. Yet the department budgets thus temporarily balanced serve to cover little more than ordinary maintenance. They have been insufficient to prevent a sharp curtailment of scientific work—the very being of the Museum, the basis of its prestige and of its unique service.

Exploration, research, publication, educational work, the Library—all are suffering for want of adequate financial support to overcome the doubling or trebling of all costs since 1914. Departments are short-handed, their activities at reduced pace. Lost through death, eminent staff scientists can not be replaced because funds are lacking to secure qualified successors. . . . Everywhere is evidence of the



discouraging hand of retrenchment laid upon Museum progress, for, even with the close budgeting of a conspicuously able financial department—even with the most careful administrative supervision—when overhead expenses are met, there is little remaining.

Become the particular pride of the people of Greater New York and a household word all over the globe, the American Museum, if it is to continue its progressive record of achievement, thus far unbroken since its founding, should have no less an increase in annual income than \$500,000. This would be assured by the Sixtieth Anniversary Endowment Fund of \$10,000,000, completion of which is the institution's greatest urgency.

Throughout its long career the American Museum has always gone forward.

Only now, in the beginning of its seventh decade, does it find current projects and future development menaced.

The plain and positive remedy is the generous subscription of this capital fund.

PROPOSED APPORTIONMENT OF THE SIXTIETH ANNIVERSARY ENDOWMENT FUND

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Research:	For permanent support of exploration, research and publication now largely dependent on special gifts	\$2,000,000
Books:	For the purchase of books new and old for the Library. Books are essential tools for carrying on all researches	300,000
Staff:	For additional assistants for curators, including highly trained productive research workers, so that more curatorial time may be given to research and publication	1,000,000
Salaries:	For raising the standard of all staff salaries to university and college grades, making them commensurate with the training, skill and ability of scientific workers	2,000,000
Exhibition Halls:	For the modernizing of old halls and the proper educational equipment of all halls (fifty, including those to be established in the near future)	500,000
Education:	For intensive high school, college and university education in the laboratories and exhibition halls of the Museum and for the extension of service to the secondary schools	1,000,000
Exhibitions:	For the preparation of existing exhibitions and collections to render the highest educational service to students and to the visiting public	1,500,000
Reserve:	Reserved for the development of future plans in connection with the addition of four new building sections to the institution	1,700,000
Total		\$10,000,000



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- I - JESUP NORTH PACIFIC EXPEDITIONS
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- IV - ROOSEVELT SOUTH AMERICAN EXPEDITION
- V - CENTRAL ASIATIC EXPEDITIONS
- VI - AKELEY AFRICAN EXPEDITIONS
- VII - DINOSAUR EXPEDITIONS
- VIII - WHITNEY WESTERN EXPEDITIONS
- IX - BIRD DEPARTMENT EXPEDITIONS

MUSEUM EXPEDITIONS



- X - WHITNEY SOUTH SEA EXPEDITION
 XI - MORDEN-CLARK ASIATIC EXPEDITION
 XII - MARTIN JOHNSON AFRICAN EXPEDITION
 XIII - VERNAY-FAUNTHORPE EXPEDITIONS
 XIV - VILLARD PERUVIAN EXPEDITIONS
 XV - ARCTURUS GALAPAGOS EXPEDITION
 XVI - MINER-WILLIAMSON EXPEDITION TO BAHAMAS
 XVII - STEFANSSON-ANDERSON EXPEDITION
 XVIII - SOUTH GEORGIA EXPEDITION



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